WHAT IS CLAIMED IS:

1. A process for removing contaminants from a surface of a semiconductor device during fabrication of an integrated circuit, comprising:

(a) cleaning the surface;

(b) forming a hydrogen termination on the surface; and

(c) exposing the surface to a nitrogen-containing gas at a relatively low temperature.

2. The process of claim 1 wherein the surface comprises a surface of a material layer selected from among a doped epitaxial material, an un-doped epitaxial material, a doped bulk silicon substrate and an un-doped bulk silicon substrate.

3. The process of claim 1 wherein the step (a) further comprises:

(a1) subjecting the surface to an HF dip; and

(a2) cleaning the surface using an RCA cleaning process;

4. The process of claim 1 wherein the step (b) further comprises:

(b1) subjecting the surface to an HF dip; and

(b2) drying the surface with isopropyl alcohol.

5. The process of claim 1 wherein the nitrogen-containing gas comprises nitrogen fluoride.

6. The process of claim 1 wherein the relatively low temperature comprises a temperature of between about 500°C and about 800°C.

7. The process of claim 1 wherein a duration of the step (c) is between about 20 seconds and 80 seconds.

8. The process of claim 1 wherein the step (c) is practiced at a temperature of less than about 800°C without compromising the integrity of the semiconductor device.

9. The process of claim 1 wherein the step (c) is practiced at about 700°C for a duration of about 20 seconds at a flow rate of about 75 sccm.

10. The process of claim 1 further comprising:

(d) forming a material layer over the surface, wherein the material layer is selected from between a doped polysilicon material and an un-doped polysilicon material.

11. The process of claim 10 wherein the steps (a), (b), (c) and (d) are performed in a single chamber.

12. The process of claim 10 wherein during the execution of the steps (a), (b), (c) and (d) the pressure is maintained at a relatively constant value.

13. The process of claim 10 wherein the temperature is within a range of between about 700°C and about 800°C.

14. The process of claim 1 further comprising:

(d) subjecting the surface to a hydrogen bake.

15. The process of claim 14 wherein the step (d) further comprises supplying hydrogen for a duration of about 60 to 90 seconds at a temperature of about 700°C.

16. The process of claim 14 further comprising:

(e) forming a material layer over the surface, wherein the material layer is selected from between a doped polysilicon material and an un-doped polysilicon material.

17. The process of claim 16 wherein the steps (a) through (e) are performed in-situ.

18. The process of claim 1 further comprising:

(d) forming a material layer over the surface, wherein the material layer comprises an arsenic-doped polysilicon material.

19. A process for removing contaminants from a surface of a semiconductor device during fabrication of an integrated circuit, comprising:

(a) exposing the surface to a nitrogen-containing gas at a relatively low temperature and at a flow rate of about 200 sccm; and

(b) depositing a polysilicon layer on the surface in situ.

20. The process of claim 19 wherein the nitrogen-containing gas comprises nitrogen fluoride.

21. The process of claim 19 wherein the relatively low temperature comprises a temperature within a range of between about 500°C and about 800°C.

22. The process of claim 19 wherein a duration of the step (a) is between about 20 seconds and 80 seconds.

23. The process of claim 19 wherein the step (a) is practiced at a temperature of less than about 800°C without compromising the integrity of the semiconductor device.

24. The process of claim 19 wherein the step (a) is practiced at about 700°C for a duration of about 20 seconds at a flow rate of about 200 sccm.

25. The process of claim 19 wherein the surface comprises a surface of a material layer selected from among a doped epitaxial material, an un-doped epitaxial material, a doped bulk silicon substrate and an un-doped bulk silicon substrate.

26. The process of claim 19 further comprising:

(c) forming a material layer over the surface, wherein the material layer is selected from between a doped polysilicon material and an un-doped polysilicon material.

27. The process of claim 26 wherein the steps (a), (b) and (c) are practiced in-situ.

28. The process of claim 26 wherein the steps (a), (b) and (c) are practiced at about the same pressure.

29. The process of claim 26 wherein the steps (a), (b) and (c) are practiced at a temperature within a range of between about 700°C and about 800°C.

30. The process of claim 19 further comprising:

(c) forming a material layer over the surface, wherein the material layer comprises an arsenic-doped polysilicon material.

31. The process of claim 19 further comprising:

(c) subjecting the surface to a hydrogen bake.

32. The process of claim 31 wherein the step (c) further comprises supplying hydrogen for a duration of about 60 to 90 seconds at a temperature of about 700°C.

33. The process of claim 31 further comprising:

(d) forming a material layer over the surface, wherein the material layer is selected from between a doped polysilicon material and an un-doped polysilicon material.

34. The process of claim 33 wherein the steps (a) through (d) are performed in-situ.